

think that the chief factor in the evolution of the now dominant pinnate type of leaf to have been the development of the petiole. Since among woody plants the more ancient multilacunar type of node predominates in temperate regions, and the palmately lobed leaf among such plants is also almost entirely confined to temperate regions, they infer that angiosperms first appeared under climatic conditions more temperate than tropical, a climate in the Mesozoic probably found only in the uplands. Furthermore, such evidence from leaves indicates that the angiosperms have come from the palmate coniferous stock, rather than from the pinnate cycadean stock; and also that the monocotyledons were derived from some ancient palmate group of the dicotyledons.—J. M. C.

Seeds of Polygonaceae.—WOODCOCK³⁰ has investigated the seeds of representative genera of Polygonaceae, and has reached some interesting conclusions. He finds that the outermost layer of the nucellus becomes transformed into a nutritive jacket before fertilization, and that this layer apparently carries food material from the chalazal region to the developing endosperm. He also describes the growth of the endosperm by the activity of a "cambium-like layer," which is differentiated very soon after cell formation begins, and also calls attention to the varying position of the embryo in reference to the other structures of the seed. He concludes that in the germination of certain of the seeds which were investigated from this standpoint, the aleurone layer has a digestive function, secreting a ferment which converts the starch of the endosperm into available form for translocation. In some cases also the absorbed carbohydrate is temporarily reconverted into starch in the tissues of the embryo, the cotyledons being the principal storage region.—J. M. C.

Fossil cycads.—Miss HOLDEN³¹ has studied the relationship between *Cycadites* and *Pseudocycas*. The latter genus was established by NATHORST for certain cycad-like leaves formerly referred to *Cycadites*, but differing from the latter genus in having a double instead of a single midrib, and in the fact that the pinnules are not narrowed, but if anything broaden at the point of attachment to the rachis. Miss HOLDEN reaches the interesting conclusion that *Pseudocycas* belongs to Bennettitales, as judged by the character of the stomata and the epidermal cells. She further concludes that the presence of a double or single midrib is of no diagnostic importance, and that the name *Pseudocycas* should be applied only to leaves whose cuticular structure is known.—J. M. C.

³⁰ WOODCOCK, E. F., Observations on the development and germination of the seed in certain Polygonaceae. *Am. Jour. Bot.* 1:454-476. pls. 45-48. 1914.

³¹ HOLDEN, RUTH, On the relation between *Cycadites* and *Pseudocycas*. *New Phytol.* 13:334-340. pl. 3. fig. 1. 1914.